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MINISTRY OF DEFENCE

2619

(I.A.F. Item)

Specification No. IND/AIR/Te/2619

In supersession of Specn.No.IND/ADE/0558(a)

Issued on :

Supersedes:

Pattern No.

Drawing No.

CORD NYLON

MB/MC2[illegible]000114	182 Kg, Breaking Strength
MB/M[illegible]000115	318 Kg, Breaking Strength
MB/M[illegible]000116	544 Kg, Breaking Strength

(Additional particulars required see clause 8)

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Received from Sh AK Verma DGM/QA on 27/01/11

1. GENERAL DESCRIPTION. The cordages described in this specification is continuous filament nylon cords of braided construction having parallel threads in the core. They are used as rigging lines in parachutes.

2. MATERIALS: High tenacity nylon continuous filament (glazed) of 210 or 60 denier for both core and braiding.

3. MANUFACTURE The yarns shall first be suitably doubled and twisted to the requirement. During the process of throwing, tension applied shall not be very high. The braiding machine shall be so adjusted that it should give firm and tight braiding without putting any extra tension on to the yarns. The cordages shall be of uniform tension and shall be as free as practicable from all manufacturing flaws. The core and braiding ends shall be absolutely free from any knots, slubs and stains. The cordage shall be free from slackness of sheath,* when tested according to the method described in the Appendix 'A' attached to the specification. The cordages shall strictly conform to the particulars laid down in clause 4 below:

*end tendency for core threads to penetrate the sheath,

4. CONSTRUCTION & QUALITY PARTICULARS

S. No.	Sheath: No. of spindles	Sheath: No. of ends	Sheath: Denier	Plaits per centimetre	Core: No. of ends	Core: Denier	Length per Kg in metre (Minimum)	Breaking strength in Kg (Minimum)
1	2	3	4	5	6	7	8	9
				See foot note (a)			See foot note (a)	See foot note (b)
1	16	16	210/3/3	5	4	210/3/3	181	182
or	16	32	60/6/3	5	4	60/15/3	145	182
2	16	32	210/3/3	4	4	210/6/3	191	318
or	16	48	60/6/4	4	5	60/15/3	170	318
or	24	48	60/6/3	5	10	60/15/3	170	318
3	16	48	210/3/3	3	6	210/6/3	60	544

NOTE: a) Length/Kg - to be determined as per the method described in Appendix 'D'.
b) Breaking Strength - to be determined as per the method described in Appendix 'B'.
c) Plaits/cm - to be determined as per the method described in Appendix 'C'.

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5. WORKMANSHIP & FINISH

The cordages shall be supplied in the natural or dyed state as specified in the contract. The cordages shall essentially be smooth to handle and shall have uniform diametre throughout, with round cross section.

In appearance, shade, general workmanship and finish and in all other respects not defined in this specification the cordages shall conform to the sealed pattern held in the custody of the Chief Inspector, Chief Inspectorate of Textiles & Clothing, PB No. 294, Kanpur.

6. TESTS:

The dyed cordage shall withstand the following fastness tests:

a) To light: When exposed to light from a suitable source (such as carbon arc), the cordage shall have a fastness of at least class V of the classification adopted by the Society of Dyers & Colourists, Bradford, Yorkshire.

b) To water: When tested as described in ISI Specn. No. IS:767-1956, there shall be no change in shade or sign of bleeding on the attached pieces of the white cotton and white woollen materials.

7. MARKING OR STAMPING

Each ball of cordage shall be tied with a card board label 4.5 cm x 2.5 cm on which shall be marked by the contractor his name or initials or recognised trade mark together with the year of supply, Cat. No. & brief designation of the store/indicated below as

BHARAT & CO.
1960
CORDAGE NYLON

8. PACKING & MARKING OF PACKAGES

A. Materials

i) Cat.No.IND 0127 Paper Kraft Wrapping)
ii) " " " 0093 Paper Packing Waterproof) Conforming to separate specification in the IND/09 series
iii) " " " 0008 Cases Wood Packing)
iv) " " " 13098 Liners Waterproof Bag)

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8. PACKING & MARKING OF PACKAGES Contd...

v) Cat.No.IHD 0259 Twine Jute 3 ply) Conforming to separate specification in the IND/TC series.

NOTE: If any of the above materials is not available it may be substituted by a suitable material to be previously approved by the Inspecting Officer/Inspecting Authority.

vi) Steel strapping or wire steel 14/15 SWG) To be approved by the Inspecting officer.

vii) Cushioning material

B. Method

i) In all cases the cordages shall be delivered in a new, clean and dry condition in continuous length knot free balls of 337 metres for cordage No. 1, 1006 metres for cordage No. 2 and 914 metres for cordage No. 3.

ii) If ordered for delivery to a local Inspection Depot the cordages shall be delivered in firm's returnable packs.

iii) In all other cases, the cordages shall be packed in accordance with details given below:

Variety of cordage	Unit Pack	Multiple pack when produced form		Details of wrapping.
		210 denier	60 denier	
1	1 Ball	24 balls	15 balls	Required length of cordages for each varieties shall first be balled in a suitable ball winding machine. Each ball shall then be wrapped first in kraft paper and then in paper packing waterproof to form a pack. The packs shall then be tied with twine jute to prevent the wrapping from unrolling. 3, 4 & 3 such packs for cordage No. 1, 2 & 3 respectively, when produced from 210 denier nylon filament and 15 and 3 such packs for cordage No. 1 and 2 respectively when produced from 60 denier nylon filament shall be suitably placed in 'Cases Wood
2	-do-	4 balls	3 balls	
3	-do-	3 balls		

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8. PACKING & MARKING OF PACKAGES Contd...

Variety of cordage	Unit Pack	Multiple pack when produced form		Details of wrapping
		210 denier	60 denier	
				Packing' provided with 'Liners Waterproof Bag'. The empty spaces, if any, shall be filled in with cushioning materials to prevent any movement of the contents inside the 'Cases wood Packing' and the top lid of the case nailed in.

C. Packing

The cases shall be either strapped or wired at two places. The strapping shall be done over battens. If wired, the wire shall be placed as close to the battens as possible but not over the battens.

Gross weight for the cordages when packed shall not exceed 96.5 Kg in any case.

D. Marking

Before despatch each case shall be legibly and indelibly marked as under:

a) Front and top of the package

i) The words 'OPEN ON THIS SIDE' in 6.5 cm RED lettering in the middle of both right and left hand edges on the top side of the case.

ii) Cat. No. and brief designation of the stores.

b) Quantity packed preceded by abbreviation 'QTY' thus QTY 10 x 5 (indicating that 10 metres are packed in a unit and 5 such units have been packed in the case).

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8. PACKING & MARKING OF PACKAGES Contd...

c) Back of the package

i) Name and address of the consignee as given in the contract.

ii) Weight of the package in kilograms preceded by abbreviation Kg.

iii) Serial No. of the individual package and the total No. of packages in the consignment e.g. 1 of 4, 2 of 4, 3 of 4 and 4 of 4 where the consignment consists of 4 packages.

d) Left end of the package

i) Supplier's name, initials or recognised trade mark.

ii) The month and year of packing in the form of a three letter abbreviation for the month and a two figure abbreviation for the year e.g. JUL 80.

9. INSPECTION:

i) If, on examination of any sample from any portion of consignment the material is found not to be fully in accordance with this specification then the whole supply may be rejected.

ii) If, on examination of 20 percent of any delivery 20 percent of those examined are found not to conform with this specification in any respect then the whole consignment may be rejected.

iii) All articles not fully in accordance with this specification shall be rejected.

Correct copy of sealed specification No. IND/AIR/TC/2019 at this date.

for CONTROLLER 18/X
CONTROLLERATE OF INSPECTION
TEXTILES & CLOTHING, KANPUR

KANPUR
DATED:

for CHIEF INSPECTOR
CHIEF ~~INSPECTORATE~~ OF TEXTILES & CLOTHING

NOTE: IND/GS and IND/TC series of Specifications/Drawings are issued by the Chief Inspector, Chief Inspectorate of General Stores, Post Box No. 127, Kanpur, and the Chief Inspector, Chief Inspectorate of Textiles and Clothing, Post Box No. 294, Kanpur respectively.

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Appendix

APPENDIX 'A'

METHOD FOR THE DETERMINATION OF SHEATH SLACKNESS AND CORE LOOPING TENDENCY

A test piece 2 metres long shall be knotted firmly at each end; a mark approximately 2.5 cm from one of the knots, shall be made on the cordage, Starting from the other knot the cord shall be passed between the thumb and finger of one hand, using firm pressure, so as to slide the sheath towards the marked end of the cordage. The position of the mark shall not move more than 0.3 cm.

The test piece shall then be folded into loops about 7.5cm long so as to be held completely in one hand and rubbed by the other hand using a rotatory motion with medium pressure for 60 rubs at about 1 rub per second. When examined the Cordage shall be free from any signs of core threads having penetrated the sheath. If there is no penetration but bulges or nodules are visible in test piece, two further tSst pieces shall be taken from different parts of the bulk supply. These two sample shall be subjected to the rubbing test and shall be free from penetration of core yarns through the sheath.

APPENDIX 'B'

METHOD FOR THE DETERMINATION OF BREAKING STRENGTH

The specimen from the selected test sample shall be conditioned for not less than 24 hours in an atmosphere having a relative humidity of 65 ± 2 percent and a temperature of 27° ± 2°C. The specimen shall be fixed in an approved Breaking Strength testing machine in which the test piece is stretched at a constant rate of 46 cm per minute; the length between the supports shall be 15 cm and the specimen tested whilst under the same condition.

If the specimen breaks at a point not within the unsupported length at a load lower than that specified, a duplicate test shall be carried out on another specimen.

APPENDIX 'C'

METHOD FOR THE DETERMINATION OF PLAITS PER CENTIMETRE

The specimen from the selected test sample, conditioned for not less than 24 hours in an atmosphere having relative humidity of 65 ± 2 percent and a temperature of 27° ± 2°C shall be subjected for one minute to a load equal to 1 percent of the specified breaking strength and the average number of plaits per centimetre determined while under this load.

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APPENDIX 'D'

METHOD FOR THE DETERMINATION OF LENGTH IN METRES PER KILOGRAM

The number of metres per Kg of cordage shall be determined as follows:-

Prior to test the test specimens shall be conditioned to moisture equilibrium in a standard atmosphere at 65 ± 2 p.c. R.H. and 27° ± 2°C Temp. Test specimens shall be left in such an atmosphere for at least 24 hours. Specimens such conditioned shall then be subjected for one minute to the load equal to 1 p.c. of the Breaking load specified for each Cordage and the weight of 3 metres length in respect of each cordages (cut under tension) be determined from which the length per Kg shall be calculated.

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9th Apl 1971

Cord nylon 66, 182 KG

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